STARS ACADEMY LAHORE

MULTAN CAMPUS

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STARS ENTRY TEST SYSTEM-2019

TEST SESSION MDCAT

Test Code: CTS-7 **Time Allowed: 150min**

BIOLOGY

1. **Chimaeric DNA is the DNA:**
A) Obtained from RNA through reverse transcription
B) DNA obtained from two different sources
C) DNA having mutations in it
D) A DNA molecule having all above issues
2. **Taq polymerase is used in:**
A) DNA fingerprinting C) Recombinant DNA technology
B) Nucleotide sequencing D) Polymerase chain reaction
3. **Natural extra-chromosomal circular DNA in bacteria are called:**
A)Endonucleases B) Restriction enzymes C)Plasmids D) Phage viruses
4. **The enzyme extracted from Thermus aquaticus bacterium is:**
A) DNA polymerase C)Taq polymerase
B) DNA polymerase & Taq polymerse D) RNA polymerase
5. **PCR can create ____________ copies of a gene:**
A) Hundreds B) Thousands C) Millions D) Billions
6. **PCR takes its name from:**
A)RNA polymerase B) DNA polymerase C) Reverse transcriptase D)DNA ligase
7. **Taq polymerase is:**
A)DNA polymerase (temperature sensitive)
B)DNA-polymerase (thermos table)
C)RNA-polymerase
D)Both a DNA-polymerase (temperature sensitive) & DNA-polymerase (thermos table)
8. **Gene pharming is the:**
A)Use of genes in forming pharmaceuticals
B)Use of transgenic farm animals to produce pharmaceuticals
C)Use of bacteria in gene formation
D)All the above
9. **Antithrombin III is being produced by:**
A) A herd of goats B) Bacteria C)Tobacco Plants D) Mouse-eared cress
10. **The best possible method of getting identical copies of the animals that have been genetically engineered to produce a biotechnology product is:**
A) Genetic engineering B) Tissue culturing C) Cloning D) All the above
11. **In the severe combined immunodeficiency syndrome (SCID), the children lack an enzyme adenosine deaminase (ADA) that is involved in the maturation of:**
A) T-cells B)B-cells C) Both 'a' & 'b' D) None of these
12. **Familial hypercholesterolemia a condition that develops when _______lack a receptor for removing cholesterol from the blood:**
A) Blood cells B) Pancreas C) Lymphocytes D) Liver cells
13. **Cystic fibrosis patients lack a gene that codes for trans membrane carrier of:**
A) Calcium ions B) Sodium ions C) Chloride ions D) Potassium ions
14. **To cure ______ dopamine-producing cells could be grafted directly into the brain:**
A) Epilepsy B)Parkinson's disease C) Alzheimer's disease D) Cystic fibrosis
15. **In a polymerase chain reaction, a synthetic sequence of nucleotides are Involved in:**
A) Denaturing B) Priming C) Copying D) all of the above
16. **When "sticky ends" are paired, they can be joined by:**
A) Restriction enzymes B) pSC 101 C) Agrose-gel D) DNA ligase
17. **A procedure called PCR is used to:**
A) Cleave DNA B) Produce recombinant DNA C) Copy gene sequences D) Clone cells
18. **DNA molecules can be cut into sections by using:**
A) ATP C) Gel electrophoresis
B) Restriction endonucleases D) Plasmids

19. In genetic engineering, DNA ligase is used as:
A) probe B) A sealing enzyme C) A restriction enzyme D) A mutagen

20. Which of the following statements is true about developing cDNA?
A) Mature mRNA directs the formation of the DNA
B) DNA taken from the nucleus is used to produce the cDNA
C) Both 'a' & 'b' are true D) None of the above are true

21. A multi cellular organism that carries a specific genetic change in each cell because of an intervention at the fertilized egg stage is
A)Transversion B)Transition C)Transgenic D)Transformant

22. Palindrome sequences in DNA:
A) Form "blunt" ends when cut by restriction enzymes
B) Reflect the same sequence on two sides
C) Are not useful in recombinant DNA experiments
D)All of the above

23. Denaturing is the separation of DNA strands in PCR that requires a temperature of:
A)94-96˚C B)84-86˚C C)70-74˚C D)60-68˚C

24. The primers are needed because:
A) It provides the process the much needed energy
B) DNA polymerase does not start the replication process; it only continues or extends the process
C) It runs the process smoothly
D It is specific in its nature

25. PCR is done in an automatic machine called:
A) Gel electrophoresis machine C)ELISA
B) Vortex mixer D)Thermocycler

26. Bone marrow stem cells are preferred in gene therapy because they:
A) Divide to produce more cells with same genes
B) Have all the possible genes in an organism
C) Easy to isolate from the body
D) All the above

27. Urine is preferred over milk for selection of biotechnology product because:
A) All animals in a herd urinate C)Animals start urinating at birth
B)It is easier to extract proteins from urine than farm milk D)All the above

28. In order to produce recombinant DNA, the following are required:
A) Gene of interest B)Molecular scissor C) A vector D)All the above

29. The virus used in recombinant DNA technology is:
A)HIV B)T_2 phage C)Lambda phage D)None of these

30. PCR is used because:
A) PCR isn't expensive
B) PCR can create millions of copies of a single gone or specific DNA piece quickly
C) PCR is very specific
D) All the above

31. How many species of Galapagos finch are there?
(A) 1 (B) 7 (C) 13 (D) 28

32. Key point of Lamarck's view about organic evolution is that every offspring
(A) Is similar to its parents
(B) Inherits characters acquired by the parental generation
(C) Shows struggle for existence (D) Repeats phylogeny in its ontogeny

33. Which of the following points which Darwin could not explain?
(A) Competition (B) Overproduction (C) Arrival of the fittest (D) Survival of the fittest

34. Which of the following did not help Darwin formulate his theory of evolution?
(A) Fossil evidence that species had changed over time
(B) Closely related species on oceanic islands
(C) Belief that the earth was several thousand years old
(D) Evidence of artificial selection in domestic animals

35. Charles Darwin gave the:
(A) Theory of special creation (C) Theory of Natural selection
(B) Inheritance of acquired characters (D) Cell theory

36. According to Darwin's theory of evolution:
(A) All individuals have an equal chance of surviving and reproducing
(B) Species are immutable
(C) Tortoises are the modern descendents of glyptodonts
(D) None of the above

37. All of the evidence gathered by Darwin to support his theory of evolution by natural selection:
(A) Was gathered based solely on observations made during his trip to the Galapagos Islands
(B) Was first presented in a book by Charles Lyell
(C) Was gathered from observations made by Darwin and from information presented by others
(D) Was presented in his book Essay on the Principle of Population

38. According to Darwin, which is the fittest organism?
(A) Organism which is very aggressive (C) Organism which is very cruel
(B Organism which is very strong (D) Organism which leaves a large number of offspring

39. Darwin suggested that populations of individual species become better adapted-to their local environments through:
(A) Evolution (C) Natural selection
(B) Inherited characters (D) All the above

40. Production of more individuals than environment can support leads to a struggle for existence among individuals of a:
(A) Generation (B) Species (C) Population (D) Community

41. Species are product of:
(A) Their parents (B) Populations (C) Individuals (D) Evolution

42. Darwin explained his theory of evolution in a book called:
(A) The Origin of species (C) The Principles of Species
(B) Survival of the Fittest (D) Around the World in Population Eighty Days

43. Genetic drift is elimination of :
(A) individual
(B) Species
(C) Choromosomes
(D) Genes of some original chraractercitics of species due to epidemics

44. The tendency of population to remain in genetic equilibrium may be disturbed by :
(A) Lack of mutations (C) Lack of random mating
(B) Random mating (D) Lack of migration

45. Hardy & Weinberg principal explains by :
(A) Genetic equilibrium (C) Evolutionary force
(B) Non random mating (D) All of these

46. New Darwinism is :
(A) population theory (C) natural selection theory
(B) Modern Mutation theory (D) Modern Synthetic theory

47. According to new Darwinian theory which of the following is responsible for the origin of new species :
(A) Mutations (C) Usefull variations
(B) Mutations together with natural selection (D) Hybridization

48. According to Hardy Weinberg's theorem what will be the value of heterozygous individuals when the value of recessive allele in population is 0.30:
A) 0.49 B) 0.42 C) 0.09 D) 0.32

49. Hardy Weinberg theorem describes the frequencies of genotypes of:
A) Non evolving populations C) Non evolving individuals
B) Evolving populations D) Evolving individuals

50. In a population with two alleles for a particular locus B,b the allele frequency of B is 0.8. What is the frequency of heterozygote if the population is at Hardy-Weinberg equilibrium?
A) 0.2 B) 0.64 C) 0.42 D) 0.32

51. According to Darwin about evolution distinct characteristics of finches found on islands due to:
A) More competition on islands C) Geographical isolation
B) Developmental difference D) Genetic

52. DNA can be introduced into any cell by all except:
A) Micro Injection.
B) Being treated with calcium salts.
C) Gel electrophoresis.
D) Being placed along with the cells into a gene gun.

53. Restriction endonuclease is also known as:
A) Molecular glue B) DNA ligase C) DNA polymerase D) Molecular scissors.

54. Which of the following properties makes plasmids suitable vectors for gene cloning?
A) Plasmids often carry antibiotic resistance gene
B) Plasmids can shuttle between prokaryotic and eukaryotic cells
C) Plasmids are small circular DNA molecules with their own replication origin site
D) Plasmids are small circular DNA molecules that can integrate with host chromosomal DNA

55. First step in genetic engineering is
A) Isolation C) Isolation of genetic material
B) Isolation of protein D) Purification of protein

56. Who among following discovered the enzyme restriction endonuclease?
A) H.O. Smith B) F. Jacob C) A. Lwoff D) G. Hounsfield

57. Genetic engineering is used in
A) Gene therapy B) Vaccine production C) Obtaining transgenic plants D) All the above

58. The first hormone artificially produced by culturing bacteria is
A) Insulin B) Thyroxine C) Adrenalin D) Testosterone

59. The technique by which ‘Dolly’ the sheep was obtained, is called
A) Cloning by gene transfer C) Cloning tissue culture of somatic cells
B) Cloning by nuclear transfer D) Cloning without help of gametes

60. Which of the following can be controlled by using biopesticides?
A) Insects B) Diseases C) Weeds D) All of them

61. The first clinical gene therapy was given for treating:
A) Chicken pox C) Adenosine deaminase deficiency
B) Rheumatoid arthritis D) Diabetes mellitus

62. The unbound cut ends are called “sticky” ends because:
A) Cuts are made between G and A C) Cut ends are palindromic
B) Codons are always triplet D) The two strands follow base pairing rule.

63. DNA finger printing refers to:
A) Molecular analysis of profiles of DNA samples
B) Analysis of DNA samples using imprinting device
C) Techniques used for molecular analysis of different specimens of DNA
D) Techniques used for identification of fingerprints of individuals

64. Restriction endonucleases:
A) Are present in mammalian cells for degradation of DNA when the cell dies
B) Are used in genetic engineering for ligating two DNA molecules
C) Are used for in vitro DNA synthesis
D) Are synthesized by bacteria as part of their defense mechanism

65. c DNA probes are copied from the messenger RNA molecules with the help of:
A) Restriction enzymes C) DNA polymerase
B) Reserve transcriptase D) Adenosine deaminase

66. The enzyme employed for amplification of DNA during PCR is commercially obtained from:
A) Streptococcus pyogenes C) Trichoderma reesi
B) Bacillus licheniformis D) Thermus aquaticus

67. A technology, which has found immense use in solving cases of disputed parentage, is:
A) Polymerase chain reaction C) Monoclonal antibody production
B) DNA fingerprinting D) Recombinant DNA technology

68. Complementary DNA (cDNA) library is made from:
A) Genomic DNA B) mRNA C) tRNA D) rRNA

69. Which one of the following pairs of terms/ names mean one and the same things?
A) Gene pool – genomic C) Cistron – triplet
B) Codon – gene D) DNA fingerprinting – DNA profiling

70. A set of bacterial clones, each containing a plasmid or phage, is called:
A) Gene library B) Gene pool C) Genophore D) Genome

71. Which of these are most widely used in Genetic Engineering?
A) Plastid B) Plasmid C) Mitochondria D) Ribosome

72. Introduction of foreign genes for improving genotype is:
A) Biotechnology B) Vernalization C) Tissue culture D) Genetic engineering

73. A single strand of nucleic acid tagged with a radioactive molecule is called:
A) Plasmid B) Probe C) Vector D) Selectable marker

74. Gel electrophoresis is used for:
A) Cutting of DNA into fragments
B) Separation of DNA according to their size
C) Construction of recombinant DNA by joining with cloning vectors
D) Isolation of DNA molecule

75. Transgenic plants are the ones:
A) Produced after protoplast fusion in artificial medium.
B) Growth in artificial medium after hybridization in the field
C) Produced by a somatic embryo in artificial medium
D) Generated by introducing foreign DNA to a cell and regeneration a plant from the cell.

76. PCR and Restriction fragment Length Polymorphism are the methods for:
A) DNA sequencing C) Study of enzymes
B) Genetic fingerprinting D) Genetic transformation

77. Restriction enzymes are used to cut:
A) Single stranded RNA C) Single stranded DNA
B) Double stranded DNA D) Double stranded RNA

78. PCR involves:
A) DNA mutation B) DNA amplification C) Gene signaling D) Gene sequencing

79. Gene amplification using primes can be done by:
A) Microinjection B) ELISA C) Polymerase chain reaction D) Gene gun

80. PCR proceeds in three distinct steps governed by: temperature, they are in order of:
A) Denaturation, annealing, synthesis C) Annealing, synthesis, denaturation
B) Synthesis, annealing, denaturation D) Synthesis, denaturation, annealing,

CHEMISTRY

81. Which of the following is not a redox reaction?
A) $MgCO_3 \longrightarrow MgO+CO_2$
B) $O_2 + 2H_2 \longrightarrow 2H_2O$
C) $Na + H_2O \longrightarrow NaOH + \frac{1}{2} H_2$
D) $SnCl_4 \longrightarrow SnCl_2 + Cl_2$

82. In the following reaction, $4P + 3KOH + 3H_2O \rightarrow 3KH_2PO_2 + PH_3$
A) P is only reduced C) P is only oxidized
B) P is both oxidized as well as reduced D) None of these

83. Which reaction is not feasible?
A) $2KI + Br_2 \rightarrow 2KBr + I_2$ C) $2KBr + I_2 \rightarrow 2KI + Br_2$
B) $2KBr + Cl_2 \rightarrow 2KCl + Br_2$ D) $2H_2O + 2F_2 \rightarrow 4HF + O_2$

84. Among the following molecules, in which does bromine show the highest oxidation number?
A) $Hg_2(BrO_3)_2$ B) Br–Cl C) $KBrO_4$ D) Br_2

85. For the redox reaction: $MnO_4^- + C_2O_4^{2-} + H^+ \rightarrow Mn^{2+} + CO_2 + H_2O$
Correct coefficients of the reactants for the balanced reaction are

	MnO_4^-	$C_2O_4^{2-}$	H^+
A)	2	5	16
B)	16	5	2
C)	5	16	2
D)	2	16	5

86. A metal ion M^{4+} loses three electrons to produce another cation. The oxidation number of the metal in the cation is
A) +3 B) +4 C) -3 D) +7

87. A, B and C have the oxidation numbers of +6, -2 and -1 respectively, the possible molecular formula when these atoms combine will be
A) A_2BC B) AB_2C_2 C) ABC_2 D) AB_2C

88. Electrolysis of dilute H_2SO_4 will give
A) SO_2 and O_2 B) H_2 and O_2 C) H_2O and H_2 D) SO_2 and H_2

89. On electrolysis of acidified water, if volume of hydrogen liberated is 5.6 cm^3, then the volume of oxygen liberated is equal to
A) 1.4cm^3 B) 2.8 cm^3 C) 8.2 cm^3 D) 5.6 cm^3

90. The best conductor of electricity is a 0.1 M solution of
A) H_2SO_4 B) CH_3COOH C) CH_3CH_2COOH D) boric acid

91. In an aqueous solution, hydrogen will not reduce
A) Ag^+ B) Cu^{2+} C) Zn^{2+} D) Fe^{3+}

92. Molten $CuCl_2$ is electrolyzed using platinum electrodes. The reaction occurring at anode is
A) $2Cl^- \rightarrow Cl_2\,(g) + 2e^-$ C) $Cl_2\,(g) + 2e^- \rightarrow 2\,Cl^-$
B) $Cu^{2+} + 2e^- \rightarrow Cu\,(s)$ D) $Cu(s) \rightarrow Cu^{2+} + 2e^-$

93. The standard reduction potential values of three metallic cations X, Y, and Z are 0.52, −3.03 and −1.18 respectively. The order of reducing power of the corresponding metal is
A) Y>Z>X B) X>Y>Z C) Z>Y>X D) Z>X>Y

94. Of the following metals, those that cannot be obtained by the electrolysis of the aqueous solution of their salts are
A) Ag and Mg B) Ag and Al C) Mg and Al D) Cu and Cr

95. A hypothetical electrochemical cell is shown below:
$A|A^+(aq),1M||B^+(aq),1M|\ B$ **The e.m.f. measured is +0.20 V. The cell reaction is**
A) $A + B^+ \rightarrow A^+ + B$ C) The cell reaction cannot be predicted
B) $A^+ + B \rightarrow A + B^+$ D) $A^+ + e^- \rightarrow A$ & $B^+ + e^- \rightarrow B$

96. What are the values of a, b, c, d for the balanced chemical equation?
$aHNO_3 + bH_2S \rightarrow cNO + dH_2O + 3S$
A) 2, 3, 2, 2 B) 2, 3, 2, 4 C) 3, 3, 2, 4 D) 4, 3, 1, 2

97. The oxidation number of Sulphur in S_8, S_2F_2, H_2S respectively, are
A) 0, +1 and -2 B) +2, +1 and -2 C) 0, +1 and +2 D) -2, +1 and -2

98. A dilute aqueous solution of Na_2SO_4 is electrolyzed using platinum electrodes. The product at the anode and cathode are
A) O_2, H_2 B) $S_2O_8^{2-}$, Na C) O_2, Na D) $S_2O_8^{2-}$, H_2

99. The standard reduction potential for Fe^{2+}/ Fe and Sn^{2+}/ Sn electrodes are −0.44 and −0.14 volts respectively. The standard e.m.f. for the following cell reaction? $Fe^{2+} + Sn \rightarrow Fe + Sn^{2+}$
A) +0.30 V B) −0.58 V C) +0.58 V D) −0.300 V

100. The standard oxidation potential E° for the half reactions are as:
$Zn \rightarrow Zn^{2+} + 2e^-$ $E^o = +0.76$ V
$Fe \rightarrow Fe^{2+} + 2e^-$ $E^o = +0.44$ V
The emf for the cell reaction: $Fe^{2+} + Zn \rightarrow Zn^{2+} + Fe$
A) +1.17 V B) −0.32 V C) +0.32 V D) 0.117 V

101. The standard reduction potentials at 298 K for the following half-reactions are given against each
$Zn^{2+}(aq) + 2e^- \rightarrow Zn(s)$ – 0.76
$Cr^{3+}(aq) + 3e^- \rightarrow Cr(s)$ – 0.74
$2H^+(aq) + 2e^- \rightarrow H_2(g)$ 0.00
$Fe^{3+}(aq) + 3e^- \rightarrow Fe(s)$ 0.77
Which is the strongest reducing agent?
A) $H_2(g)$ B) Cr(s) C) Zn (s) D) Fe

102. When white phosphorus reacts with caustic soda, the products are PH_3 and NaH_2PO_2. This reaction is an example of
A) oxidation B) reduction C) disproportionation D) neutralization

103. For the equation
$NO_3^- + 4H^+ + e^- \rightarrow 2H_2O + NO$; the number of electrons in its balanced form would be
A) 6 B) 4 C) 3 D) 9

104. The oxidation number of carbon in CH_2Cl_2 is:
A) -4 B) 0 C) +4 D) -2

105. Which of the following is the strongest reducing agent?
A) Mg B) K C) Na D) Br_2

106. Consider the metals: Mg, Zn, Ag, Cu. Based on their reactivity order, pick the correct statement:
A) All four metals produce hydrogen gas on reacting with dil. acids
B) Ag will substitute Cu from its aqueous solution
C) Mg will substitute Zn from its aqueous solution
D) Cu will substitute Mg from its aqueous solution

107. Which of these chemical reactions is an oxidation-reduction reaction:
A) $Fe + S \rightarrow FeS$ C) $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$
B) $CO_2 + H_2O \rightarrow H_2CO_3$ D) $H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + 2H_2O$

108. What happens to the oxidizing agent in an oxidation-reduction reaction:
A) It is oxidized as it gains electrons C) It is reduced as it gains electrons
B) It is oxidizing as it loses electrons D) It is reduced as it loses electrons

109. Aluminium is prepared by electrolysis of bauxite having formula:
A) Al_2O_3 B) $Al_2O_3 \cdot 2H_2O$ C) $Al_2O_3 \cdot 3H_2O$ D) $Al_2O_3 \cdot H_2O$

110. During electrolysis of dilute aqueous solution of KNO_3, which specie is evolved at anode?
A) O_2 B) H_2 C) NO_2 D) NO

111. The metal electrode which will act as anode when connected to lead electrode in a Voltaic cell?
A) Ag B) Hg C) Au D) Ni

112. The following reaction represents the process used to produce iron from iron (III) oxide
$Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$ What is the reducing agent in this?
A) Fe B) CO C) CO_2 D) Fe_2O_3

113. A substance which in molten state or in solution from allows electric current to pass through it is called:
A) electrolyte B) Non-electrolyte C) insulator D) semi conductor

114. A cell in which chemical energy in converted to electrical energy is called:
A) Electrolytic cell C) Galvanic cell
B) Nelson's cell D) Down cell

115. Which metal can be used as a sacrificial electrode to prevent rusting of an iron pipe?
A) Au B) Ag C) Cu D) Mg

116. Which of the following chemical reactions depicts the oxidizing behavior of H_2SO_4?
A) $2HI + H_2SO_4 \rightarrow I_2 + SO_2 + 2H_2O$ C) $Ca(OH)_2 + H_2SO_4 \rightarrow CaSO_4 + 2H_2O$
B) $NaCl + H_2SO_4 \rightarrow NaHSO_4 + HCl$ D) $2PCl_5 + H_2SO_4 \rightarrow 2POCl_3 + 2HCl + SO_2Cl_2$

117. When fused $PbBr_2$ is electrolyzed:
A) bromine appears at cathode C) lead is deposited at the cathode
B) lead appears at the anode D) none of these happens

118. **Which one of the following represents the same net reaction as the electrolysis of aqueous H_2SO_4:**
A) electrolysis of water
C) electrolysis of molten NaCl
B) electrolysis of aqueous HCl
D) electrolysis of aqueous NaCl

119. **In a galvanic cell, the reaction, $2H_2O \rightarrow O_{2(g)} + 4H^+ + 4e^-$, occurs at the:**
A) cathode
B) salt bridge
C) anode
D) wire of external circuit

120. **Which of the following conduct electricity due to the migration of electrons only:**
A) copper metal
B) NH_4Cl
C) NaCl molten
D) NaCl solution

121. **Alkali metals have:**
A) lower value of reduction potential than coinage metals
B) equal values of reduction potential coinage metals than
C) higher value of reduction potential than coinage metals
D) none of these

122. **The electrode with more negative value of reduction potential acts as:**
A) cathode
B) electrode
C) anode
D) none of these

123. **Caustic soda is obtained by electrolysis of conc. aqueous solution of NaCl in a cell called:**
A) Galvanic cell
B) Down's cell
C) Nelson's cell
D) Voltaic cell

124. **Strongest oxidizing agent in the electrochemical series is:**
A) Li
B) H_2
C) F_2
D) I_2

125. **The cell potential (E^o_{cell}), for an oxidation-reduction reaction was found to equal 1.10V. What can be said about this reaction:**
A) at equilibrium
B) non-spontaneous
C) endothermic
D) spontaneous

126. **In galvanic cell, a salt bridge is used in order to:**
A) maintain flow of electric current
C) keeps electrical neutrality in each half cell
B) prevent mixing of two solutions
D) all of the above

127. **Electrolysis is the process in which a chemical reaction takes place at the expense of:**
A) chemical energy
B) heat energy
C) electrical energy
D) none of these

128. **Standard reduction polentas of four hypothetical metals W, X, Y and Z are +0.34V, −1.05V, −2.12V and + 1.37V respectively, which is most reactive metals:**
A) W
B) X
C) Y
D) Z

129. **$C_2O_4^{2-} \rightarrow 2CO_2$ + x electrons. The value of "x" is:**
A) 2
B) 4
C) 6
D) 8

130. **In which of the following reaction, oxidation number of N does not change**
A) $2NO_2 + H_2O \rightarrow HNO_3 + HNO_2$
C) $N_2 + O_2 \rightarrow 2NO$
B) $2NO_2 \rightarrow N_2O_4$
D) $NH_4NO_2 \rightarrow N_2 + 2H_2O$

131. **The reaction $2\,K_2MnO_4 + Cl_2 \rightarrow 2KMnO_4 + 2KCl$ is**
A) Chlorination of K_2MnO_4
C) Neutralization reaction
B) Neither oxidation nor reduction
D) Oxidation reduction reaction

132. **In which of the following changes there is a transfer of five electrons?**
A) $MnO_4^{2-} \rightarrow MnO_2$
C) $CrO_4^{2-} \rightarrow Cr^{+3}$
B) $MnO_4^{-} \rightarrow Mn^{+2}$
D) $Cr_2O_7^{2-} \rightarrow 2Cr^{+3}$

133. **The blue colour of the copper sulphate disappears on adding zinc granules to it. It is because of**
A) Oxidation of Zn^{2+}
C) Reduction of Cu^{+1}
B) Oxidation of Cu atoms
D) Reduction of Cu^{2+}

134. **In the conversion of BrO^{-1} to BrO_3^{-1}, the oxidation state of bromine changes from**
A) 2 to 5
B) 1 to 5
C) 0 to −3
D) 0 to 5

135. **The +1 oxidation state of P is found in**
A) H_3PO_3
B) H_3PO_4
C) H_3PO_2
D) $H_4P_2O_7$

136. **In the following equation $ClO_3^- + 6H^+ + X \rightarrow Cl^- + 3H_2O$, then X is**
A) 0
B) O_2
C) $6e^-$
D) $5e^-$

137. **Which element undergo reduction & oxidation respectively in the reaction given below**
$(NH_4)_2Cr_2O_7 \rightarrow N_2 + Cr_2O_3 + 4H_2O$
A) Hydrogen & nitrogen
C) Chromium and nitrogen
B) Nitrogen & Chromium
D) Chromium & hydrogen

138. **$Cr^{+3} + 3e^- \rightarrow Cr$ $\quad E^\circ_{(Red)} = -0.74V$**
$Fe^{+3} + 3e^- \rightarrow Fe$ $\quad E^\circ_{(Red)} = +0.77V$
The cell potential of the feasible Galvanic cell?
A) +0.03
B) +1.51
C) −15.1
D) −0.03

139. **Which of the following solid is a better conductor of electricity?**
A) Pure NaCl crystals
C) Diamond
B) Graphite
D) Marble pieces

140. **Which couple is used for balancing purpose If medium of the following reaction is acidic.**
$CN^{-1} + MnO_4^{-1} \rightarrow CNO^{-1} + MnO_2$
A) H^{+1} & H_2O
B) OH^{-1} & H_2O
C) SO_4^{-2} & H_2O
D) All of these

PHYSICS

141. A kilo ampere· hour is a unit of:
A) current B) charge per time C) power D) charge

142. An electron traveling north enters a region where the electric field is uniform and points north. The electron:
A) speeds up B) slows down C) veers east D) veers west

143. The equipotential surfaces associated with a charged point particles are:
A) radially outward from the particle C) horizontal planes
B) vertical planes D) concentric spheres centered at the particle

144. Two small charged objects attract each other with a force F when separated by a distance d. If the charge on each object is reduced to one-fourth of its original value and the distance between them is reduced to d/2 the force becomes:
A) F/16 B) F/8 C) F/4 D) F/2

145. A capacitor is a perfect insulator for
A) direct current C) both for the direct and alternating current
B) alternating current D) rapidly fluctuating current

146. A soap bubble is given a negative charge then its radius:
A) decreases C) remains unchanged
B) increases D) nothing can be predicted as information is insufficient

147. The dielectric constant K of an insulator cannot be:
A) 4 B) 6 C) ∞ D) 9

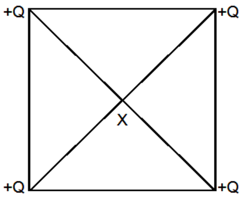
148. Suppose we have two charges q_1, q_2 are placed in vacuum at a distance d, and the force acting between them is F.If a medium of dilectric constant 4 is introduced between them, the ratio of the forces acting on each other will be
A) 4 B) 1 C) $\frac{1}{2}$ D) $\frac{1}{4}$

149. A uniform wire of length 5 m is carrying a steady current. The electric field inside it 0.2 V/m. The potential difference across the ends of the wire is:
A) 1 volt B) 0.5 volt C) 0.1 volt D) 5 volt

150. When 10^{14} electrons are removed from a neutral metal sphere, the charge on the sphere becomes
(A) $16\ \mu C$ (B) $-16\ \mu C$ (C) $32\ \mu C$ (D) $-32\ \mu C$

151. A total charge *Q* is broken in two parts Q_1 and Q_2 and they are placed at a distance R from each other. The maximum force of repulsion between them will occur, when
(A) $Q_2 = \frac{Q}{R}, Q_1 = Q - \frac{Q}{R}$ (B) $Q_2 = \frac{Q}{4}, Q_1 = Q - \frac{2Q}{3}$
(C) $Q_2 = \frac{Q}{4}, Q_1 = \frac{3Q}{4}$ (D) $Q_1 = \frac{Q}{2}, Q_2 = \frac{Q}{2}$

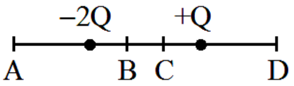
152. Four identical point charges are arranged at the concerns of a square as shown. Which statement about the values of the electric field strength E and the electric potential V at point x in the middle of the square is true?



A) E $\neq$ 0 and V = 0 C) E = 0 and V $\neq$ 0
B) E $\neq$ 0 and V $\neq$ 0 D) E = 0 and V = 0

153. The insulation property of air breaks down at $E = 3 \times 10^6$ *voltlmetre*. The maximum charge that can be given to a sphere of diameter $5m$ is approximately (in coulombs)
(A) 2×10^{-2} (B) 2×10^{-3} (C) 2×10^{-4} (D) 2×10^{-5}

154. Two point charges –2Q and +Q are situated as shown. At which point could be the resultant electric field due to these charges be zero?



A) A B) B C) C D) D

155. In discussing electric fields, the terms 'electric field strength', 'electric potential' and 'potential gradient' are used. Which statement about these terms is correct?
A) Electric field strength at a point is the work done in bringing unit positive charge from infinity to the point
B) Electric potential and potential gradient are both scalar quantities
C) The potential gradient at a point is numerically equal to the electric field strength at that point
D) Unit potential gradient exists between any two points, if one joule of work is done in transporting one coulomb of charge between the points

156. A uniform electric field having a magnitude E_0 and direction along the positive $X-$axis exists. If the potential V is zero at $x = 0$, then its value at $X = +x$ will be
(A) $V_{(x)} = +xE_0$ (B) $V_x = -xE_0$ (C) $V_x = +x^2 E_0$ (D) $V_x = -x^2 E_0$

157. **A charged particle is suspended in equilibrium in a uniform vertical electric field of intensity 20000 *V/m*. If mass of the particle is $9.6\times10^{-16}\,kg$, the charge on it and excess number of electrons on the particle are respectively $(g=10\,m/s^2)$**

(A) $4.8\times10^{-19}C, 3$ (B) $5.8\times10^{-19}C, 4$ (C) $3.8\times10^{-19}C, 2$ (D) $2.8\times10^{-19}C, 1$

158. **The capacity of a parallel plate condenser is $5\mu F$. When a glass plate is placed between the plates of the conductor, its potential becomes $1/8th$ of the original value. The value of dielectric constant will b**

(A)1.6 (B) 5 (C)8 (D)40

159. **A capacitor is charged by using a battery which is then disconnected. A dielectric slab is then slipped between the plates, which results in**

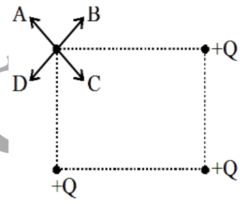
(A) Reduction of charge on the plates and increase of potential difference across the plates

(B) Increase in the potential difference across the plate, reduction in stored energy, but no change in the charge on the plates

(C) Decrease in the potential difference across the plates, reduction in the stored energy, but no change in the charge on the plates

(D) None of the above

160. **The diagram shows point charges, each of magnitude Q, placed at three corners of a square. What is the direction of the resultant electric field at the fourth corner?**



A) line along A C) line along C

B) line along B D) line along D

161. **The true statement is, on increasing the distance between the plates of a parallel plate condenser**

(A) The electric intensity between the plates will decrease

(B) The electric intensity between the plates will increase

(C) The electric intensity between the plates will remain unchanged

(D) The P.D. between the plates will decrease

162. **A $6\mu F$ capacitor is charged from $10\ volts$ to $20\ volts$. Increase in energy will be**

(A) $18\times10^{-4}J$ (B) $9\times10^{-4}J$ (C) $4.5\times10^{-4}J$ (D) $9\times10^{-6}J$

163. **Force acting upon a charged particle kept between the plates of a charged condenser is F . If one plate of the condenser is removed, then the force acting on the same particle will become**

(A)0 (B) $F/2$ (C) F (D) $2F$

164. **An uncharged capacitor is connected to a battery. On charging the capacitor**

(a)All the energy supplied is stored in the capacitor

(b)Half the energy supplied is stored in the capacitor

(c)The energy stored depends upon the capacity of the capacitor only

(d)The energy stored depends upon the time for which the capacitor is charged

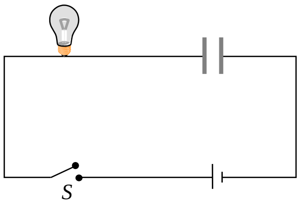
165. **A light bulb, a capacitor and a battery are connected together as shown here, with switch S initially open. When the switch S is closed, which one of the following is true**

(A)The bulb will light up for an instant when the capacitor starts charging

(B)The bulb will light up when the capacitor is fully charged

(C)The bulb will not light up at all

(D)The bulb will light up and go off at regular intervals



166. **The electric field lines emerge from the charges in:**

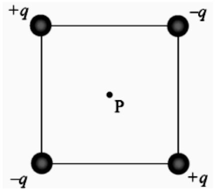
A) Three dimensions C) Two dimensions

B) One dimension D) All of above

167. **The capacitance of parallel plate capacitor is $\epsilon_o A/d$ it is also written as**

A) $A/4\pi Kd$ B) $A/4\pi d$ C) $KA/4\pi d$ D) $4\pi\epsilon_o A/d$

168. **Four charges are located on the corners of a square as shown in the drawing. What is the direction of the net electric field at the point labeled P?**



A) toward the upper left corner of the square

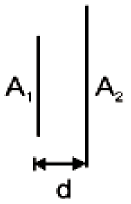
B) toward the middle of the right side of the square

C) toward the middle of the bottom side of the square

D) There is no direction. The electric field at P is zero N/C

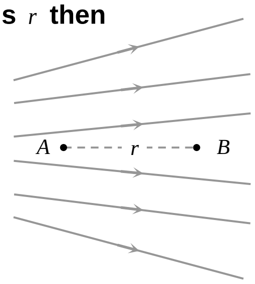
169. **The capacitance of capacitor of plate areas A_1 and A_2 (A_1 less than A_2) at distance d is**

A) $\dfrac{A_1\varepsilon_o}{d}$ B) $\dfrac{(A_1+A_2)\varepsilon_o}{2d}$ C) $\dfrac{A_2\varepsilon_o}{d}$ D) $\dfrac{\sqrt{A_1A_2}\ \varepsilon_o}{d}$



170. Two point charges +4C and +8C repel each other with force 32N, if charge of -6C is added to each charge the force will be
A) 4N repulsive B) 32N Attractive C) 4N Attractive D) 48N

171. Figure shows the electric lines of force emerging from a charged body. If the electric field at *A* and *B* are E_A and E_B respectively and if the displacement between *A* and *B* is r then



(A) $E_A > E_B$ (C) $E_A < E_B$
(B) $E_A = \frac{E_B}{r}$ (D) $E_A = \frac{E_B}{r^2}$

172. When air is replaced by a dielectric medium of constant k, the maximum force of attraction between two charges separated by a distance
(A) Decreases k times (C)Remains unchanged
(B) Increases k times (D) increases 2k times

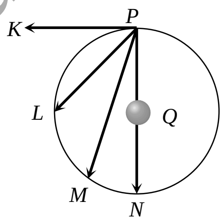
173. Two similar spheres having $+q$ and $-q$ charge are kept at a certain distance. F force acts between the two. If in the middle of two spheres, another similar sphere having $+q$ charge is kept, then it experience a force in magnitude and direction as
(A) Zero having no direction (C) $8F$ towards $-q$ charge
(B) $8F$ towards $+q$ charge (D) $4F$ towards $+q$ charge

174. When a body is earth connected, electrons from the earth flow into the body. This means the body is…..
(A) Unchanged (B) Charged negatively (C) Charged positively (D) An insulator

175. In comparing the gravitational force and the electric force, both forces
A) are always attractive and can never be repulsive
B) are inversely proportional to the separation between the masses or charges to the first power
C) are directly proportional to the product of the masses or the charges
D) increase in magnitude as the distance between the masses or charges increases

176. Which of the following is correct statement?
A) Electric force is essential where gravitational force is present
B) Gravitational force is essential where electric force is present
C) Gravitational force is stronger than electric force
D) Electric force is present between two massless bodies

177. In the figure the charge Q is at the centre of the circle. Work done is maximum when another charge is taken from point P to



(A) K
(B) L
(C) M
(D) N

178. An alpha particle is accelerated through a potential difference of $10^6\ volt$. Its kinetic energy will be
(A) $1\ MeV$ (B) $2\ MeV$ (C) $4\ MeV$ (d) $8\ MeV$

179. A hollow metal sphere of radius 5*cm* is charged such that the potential on its surface is 10*V*. The potential at a distance of 2*cm* from the centre of the sphere
(A) Zero (B) 10 *V* (C)4 *V* (D)10/3 *V*

180. The work done in carrying a charge of $5\mu C$ from a point *A* to a point *B* in an electric field is 10*mJ*. The potential difference $(V_B - V_A)$ is
(A) + 2*kV* (B) – 2 *kV* (C) + 200 *V* (D) – 200 *V*

ENGLISH

Choose the correct word words to complete each sentence.

181. I _________ from your speech that you are a foreigner.
A) Refute B) Slump C) hassle D) Presume

182. A referee from a _______ country will officiate at the competition.
A) uninterested B) unpalatable C) neutral D) contemplated

183. When the couple had walked some hundred yards ahead of him, he hurriedly moved ___ them.
A) after B) through C) behind D) away

184. It was more for the sake of talking of him than anything else that I kept _____ wit h him.
A) on B) up C) with D) Away

SPOT THE ERROR: In the following sentences some segments of each sentence are underlined. Your task is to identify that underlined segment of the sentence, which contains the mistake that needs to be corrected. Fill the circle corresponding to that letter under the segment in the MCQ Response Form.

185. He tries to recall whatever good he had done during his life time when he was living on this world.
A B C D

186. I dreamt I flew out from the window in my nightshirt. I went up and up.
A B C D

187. I enjoyed myself in the party, but some of the other guests didn't enjoy themselves as much.
A B C D

188. Spaghetti, which we eat at least twice a week, is one of my family's favourite meal.
A B C D

189. The book, when it was final returned, was torn and stained.
A B C D

190. I am looking for someone whom can watch my dog while I go on vacation.
A B C D

In each of the following questions, four alternative sentences are given Choose the CORRECT one and fill the circle corresponding to that letter in the MCQ Response Form.

L

191.
A) One must get oneself insured if one intends to drive on city streets.
B) One must get oneself insured if one's intends to drive on city streets.
C) One must get oneself insured if one intends to drive in city streets.
D) One must get oneself insure if one intends to drive on city streets.

192.
A) The alligator ate the large bird and found himself feeling quite full.
B) The alligator ate the large bird and found herself feeling quite full.
C) The alligator ate the large bird and found itself feeling quite full.
D) The alligator ate the large bird and found itself feeling quiet full.

193.
A) The police needed details who could help identify the robber.
B) The police needed details which could help identify the robber.
C) The police needed details whom could help identify the robber.
D) The police needed details which could help identifying the robber.

194.
A) The young man seated on the cement bench was watching with interest.
B) The young man seated on the cement bench was watching from interest.
C) The young man seated on the cement bench was watching off interest.
D) The young man seated at the cement bench was watching with interest.

195.
A) I could not remember them on the time in their entirety.
B) I could not remember them over the time in their entirety.
C) I could not remember them at the time in their entirely.
D) I could not remember them at the time in their entirety.

196.
A) But she had not always pleaded to leniency.
B) But she had not always pleaded of leniency.
C) But she had not always pleaded for leniency.
D) But she had not always pleaded for lenient.

197.
A) He had a sudden vision of thousands and thousands of boys, from the age of Elizabeth.
B) He had a sudden vision of thousands and thousands of boys, at the age of Elizabeth.
C) He had a sudden vision of thousands and thousands of boys, to the age of Elizabeth.
D) He had a sudden vision of thousand and thousands of boys, from the age of Elizabeth."

S an Campus

198.

A) He would sort them out and made a book of them.

B) He would sorted them out and make a book of them.

C) He would sort them out and make a book from them.

D) He would sort them out and make a book of them.

In each of the following questions, four alternative meanings of a word are given. You have to select the NEAREST CORRECT MEANING of the given word and fill the appropriate Circle on the MCQ Response Form.

199. Propelling

A) propulsive B) lethargic C) obese D) succinct

200. Placidly

A) amiably B) Imperturbably C) amicably D) stunningly

201. Pensively

A) cogitatively B) unexpectedly C) reverentially D) Deferentially

202. Presume

A) Surmise B) concur C) retreat D) endorse

203. Negligence

A) Heed B) Tendency C) Propensity D) Nonchalance

In each of the following questions, four alternative words are given. You have to select the option OPPOSITE in meaning to the given word and fill the appropriate Circle on the MCQ Response Form.

204. Operation

A) Indolence B) vivacity C) vigour D) verve

205. Negate

A) Belie B) nullify C) Second D) Concur